

ART. IV. *Contributions to the Physiology and Pathology of the Nervous System.* By W. E. HORNER, M. D. Adjunct Professor of Anatomy in the University of Pennsylvania.

THE following cases are offered as contributions to our knowledge of the nervous system; a subject upon which the labours of GALL, of BELL, of SERRES, of FLOURENS, &c. have shed a flood of light, but many points of which require further elucidation, and still more remain involved in utter obscurity.

CASE I. *Chronic Hydrocephalus.*—Present, Dr. J. K. MITCHELL, attending physician, and Dr. S. JACKSON. Autopsy eighteen hours after death. Weather moderate.

Master M. aged eight and a half years; had his head no larger than usual at the period of his birth. At the age of six weeks symptoms of hydrocephalus were manifested, for which he underwent an active treatment which was continued for some time. As he advanced in age he began to walk; his head continued to grow inordinately; his stature was not much affected, and he reached almost the size which is common to boys of eight years. He could walk, run, and participated in the amusements common to childhood; was sent to school, where he learned very readily the subjects usually taught; was remarkably smart, sprightly, and intelligent in his conversation; was very fond of music, and learned readily a variety of tunes; his memory was also excellent.

For a long time after birth, the sutures of the cranium were open, and the fontanelles unusually large; the ossification was, however, finally completed, and the cranium became firm. The size of his head was so great that he attracted much attention; and he was apt to fall, especially forwards, from readily losing his equilibrium.

Dec. 12th, 1828, he fell against a door, and bruised his forehead on the left side considerably. In an hour afterwards he vomited, became very sick, and took to bed, and died the next evening about nine o'clock. The subsequent day, at three P. M. we proceeded to examine his head. Its dimensions were as follows: the largest horizontal circumference of the cranium measured around the frontal and parietal protuberances was twenty-eight inches; peripheral distance between meatus auditorii externi, nineteen and a half inches; peripheral distance from root of nose to occipital protuberance, nineteen and a half inches.

*Diameters measured with Callipers.*—Antero-posterior,  $9\frac{3}{10}$  inches

—Between parietal protuberances,  $7\frac{1}{2}$  do.—Between temples, back part, 7 do.—From chin to vertex, 10 do.—Between meatus auditorii externi, 5 do.

The bones of the cranium were of the thickness common to children of his age, and the sutures firmly fastened, the sagittal was continued to the root of the nose. There was an os triquetrum on each side of the frontal suture, but no other supernumerary pieces. The integuments of the head were thin and stretched.

The dura mater adhered firmly to the cranium, especially along the sutures. The pia mater was vascular; no pathological state was perceptible in the arachnoidea, either internally or externally. The convolutions were much shallower than usual, being about a third the common depth.

The lateral ventricles together contained *five* pints of limpid transparent serum, and were distended into perfect bags; the thickness of the cerebrum around them varied in places from four to eight lines. Having made a long cut from above into each lateral ventricle, I found the medullary surface of the ventricles disposed to separate itself from the contiguous part of the cerebrum. The corpus callosum was thinned to about one line, and stretched to the breadth of an inch and a half, and its raphe was semi-diaphanous. Beginning, therefore, at the corpus callosum, we peeled the upper circumference of the lateral ventricle off, as one would tear off paper from a wall; we continued to trace the layer along, and stripped off in the same way the lower circumference of the lateral ventricles, the layer coming off successively from the hippocampi, and from the thalamus; we found this layer continuous with the fornix which was raised up in the progress of this peeling process. I endeavoured to strip by the same process the surface of the tubercula quadrigemina and the valve of the cerebellum, by the continuation of structure with the surface of the thalamus, but it failed.

The process was executed on both lateral ventricles with equal facility, so that a medullary layer one line in thickness was stripped off completely from the whole periphery of each lateral ventricle, beginning at the corpus callosum and ending at the internal side of the thalami. It is worthy of specific notice that a cineritious layer of the same thickness, and continuous with the other, came off from the surface of the corpus striatum.

The septum lucidum was wanting in great measure, there being a free communication of the lateral ventricles of some inches in diameter between the corpus callosum and the fornix. The margin of the

imperfect partition formed by the septum was rounded, and had no appearance of laceration.

The cineritious substance of the cerebrum was softened, and followed the pia mater in stripping off this membrane. But the cineritious substance could not be detached clearly from the sub-cineritious medullary substance in consequence of their intimate coalition.

Taking then the thickness of the cerebrum into view, from its surface to the surface of the lateral ventricles, there were evidently made out three layers of matter, the external cineritious, then the sub-cineritious medullary layer forming the convolutions and their bases, and then the layer of medullary matter forming the periphery of the ventricles. These two layers of medullary matter seemed perfectly distinct from one another, 1st, by the almost spontaneous separation which they made when it first attracted our attention, and then the perfect facility with which the ventricular layer was stripped off universally from the other. 2d, In examining the vascular arrangement, it appeared that the adjacent surface of each had their capillaries branching out distinctly, as is the case with contiguous but distinct membranes elsewhere.

The capillaries of the encephalon were generally congested with red blood. The cerebellum, pons, crura, and the base of the encephalon was healthy. There was no sub-arachnoid infiltration anywhere, the convolutions being close and compacted.

The examination was not extended beyond the head.

For preparations of peripheral layer of ventricles, see Anat. Museum. This was the only part we were permitted to bring away.

I am indebted to Dr. J. K. Mitchell, the family physician, for the following minute history of the patient, in a letter to myself.

“William M. was born in Philadelphia on the 4th of June, 1820, the fourth child of his parents. Although his entrance into the world was tedious, no remarkable difficulty attended his birth, nor was there at first perceived any peculiarity in his conformation. When about six weeks old, incessant cries and a distressing restlessness indicated the existence of pain, and in a few hours he became incapable of drawing nourishment from his mother, making many fruitless essays with a smacking sound. A physician, after examining his mouth, and dividing the *frenum linguæ*, expressed some fears of the occurrence of disease of the brain. Severe and protracted diarrhœa soon followed, and a very manifest enlargement of the head confirmed the opinion of the medical adviser.

After a variety of treatment, the general health of the child was restored, and continued unimpaired until about a month before his decease, which happened on the 13th of December, 1828, when in the 9th year of his age. During the whole of this period of nearly eight years, his head continued to enlarge without being connected with the slightest head-ache, or any functional derangement whatever. The bones of the cranium became firmly united, and the fontanelles closed in his fifth year.

When fifteen months old the child spoke well, and at eighteen months was able to sing a variety of musical airs with tolerable correctness; and always exhibited a strong predilection for music.

Nearly four years elapsed before he was able to balance himself on his legs, and he was not a confident walker until five years of age. Indeed, the great weight of his head rendered him always very liable to falls, and caused him frequently to impinge upon his forehead. Sometimes, when at school, he fell backwards from the form.

His intellectual faculties generally were very respectable, and his powers of observation rather remarkable. But his memory both of language and sentiments, was such as to create surprise in those who took the pains to converse with him. The following example of his powers of recollection may not be amiss. A customer of his father having been absent two years, returned, and on his entrance into the shop, saluted as an acquaintance its inmates; but they had forgotten him. On turning to little M——, the latter immediately called him by name, inquired kindly about him, and then told him that he had not been to see them for two years.

Of a grave and quiet temperament, he preferred the society of his seniors, and took little interest in the common pastimes of childhood. Only sedate children were agreeable to him.

For so youthful a person, his sentiments and affections were of a lofty character. Seeing the distress of his mother, when commercial affairs took his father to Europe, the child, then five years of age, said, 'Father will soon be back; if he dont come again, I will be a husband to my mother, and will work for her and take care of her when she is old.'

For two years before his death, little M. became affected by religious impressions, which grew stronger and stronger until his death. Often advising others, he presented in his own conduct a fine exemplification of his principles, being distinguished among the children of the family and the school, for love of truth and general sincerity of character. At length, even while in full health and vigour,

he spoke of death as a thing to be desired; and when dying, expressed pleasure at the approaching crisis.

On Sunday evening, several weeks before his decease, he was seized with severe nausea and vomiting, which having subsided, returned on the following Sunday, and so on with weekly intervals, until, on Friday, the 12th of December, a severe fall, followed in eight or ten hours by like symptoms, terminated his existence.

During his short illness, he referred all his pain to his stomach, and never complained of head-ache or vertigo. His pulse became gradually slower and more feeble, the temperature of the surface declined: but his mental faculties, and his affections, remained unchanged until he was in *articulo mortis*.

The singular nature of this case, together with the curious anatomical facts disclosed by your *post mortem* examination, induced me to make a minute inquiry into the history of the subject of it, previously to the period at which I was called to visit him, which I now beg leave to convey to you."

**CASE II. Dropsy of Brain and Tumour on Cerebellum producing Hemiplegia, Blindness, Deafness, Loss of Touch, &c. &c.**—Mrs. Rebecca D. ætat. about thirty, the mother of two young and healthy children, and of a good constitution, was taken in the spring of 1827, with symptoms of paralysis after some slight indisposition. I saw her in August, and the symptoms were then, intermittent loss of vision in left eye, slow winking on that side, difficulty of hearing, and of articulation, loss of taste on left side of tongue, pain in the back part of the head, incessant roaring in her left ear, mouth drawn to right side. Diminished myotility in left upper and lower extremity, and inclination of the body to that side when sitting; in walking across the room with assistance, she invariably swerved from the straight line towards the left side, so that her motion became diagonal to the left.

She also complained of pain in the bladder, especially on making water; and whilst I was examining this organ a few days afterwards with a catheter, she was suddenly seized with an epileptic fit, to which, under the name of faintings, she had been subject for several months, having had attacks upon any sudden emotion even when a girl.

Her functions in other respects were healthy, and her menses regular.

I treated her by adopting repeated leeching to the temples, bleeding from the arm, blisters on back of neck, and on temples; light nutritious diet, with some ligneous teas, as sarsaparilla, valerian, and

from time to time, from three to five grains of blue mass or cathartic pills of aloes and calomel daily. She improved so much under this treatment in four or five weeks, that she ceased to occupy her bed habitually, improved in flesh, could, by clinging to the furniture, take her turns around the bed room, and finally got down stairs. The several symptoms stated, all got better, excepting the roaring and pain in the head.

With occasional slight changes for better or for worse, she passed through the winter. In the March of 1828, the symptoms being stationary, Dr. PARRISH was joined in consultation, and upon his suggestion, rust of iron was taken to the amount of eight or ten grains three times a day, and an issue was permanently fixed on each side of the head after she had been twice blistered all over it. This treatment was persisted in for two months without benefit; her mouth became sore from the steel rust, and she complained of its heating her stomach.

In the progress of this part of the treatment, I observed for the first time, though the symptom might have been constantly present, that there was a loss of sensation in the skin of the left side of the face, from the middle line backwards, and that the left conjunctiva was also torpid, so that it like the skin might be scratched with the end of a straw without her feeling it.

Her epileptic paroxysms during all this time recurred irregularly at intervals of ten, fifteen, or twenty days. In the latter part of June, 1828, she went into the country by advice, and was absent till about the end of August. On her return, the symptoms were for the most part aggravated. She had become thinner; her stomach rejected frequently its contents; I thought that this might arise from emetics of twenty grains of ipecacuanha each, having been administered to her in the early part of the summer three times a week for four or five weeks in succession, just before she left the city. The value of this opinion will, however, be seen from the dissection. The blindness of the left eye, which formerly had been only intermittent, now prevailed incessantly, with occasional blindness of the right also, the deafness of the left side had increased with the noise and pain in her head at the back part; insensibility of left side of face the same; to this was added a diminished myotility in it, keeping it almost stationary when she talked; left side of tongue insensible to taste, mouth drawn somewhat to right side, myotility of left extremities also diminished, but no want of sensibility in their integuments.

Her menses had now been suspended for four months, and her

bowels were disposed to constipation; there was a more frequent recurrence of the epileptic paroxysms.

From this period, (August 28th,) till the day of her death, (October 19th, eleven o'clock P. M. in an epileptic fit,) the symptoms increased regularly and gradually, total blindness supervened for a month previous to death, she could no longer sit up out of bed with any comfort, her articulation became thick and slow, her swallowing difficult and slow, and when the food was down it was frequently brought up again involuntarily; and what was remarkable, the process was a sort of ruminating one, for she could immediately after swallow with an appetite, and digest well; this leads us to infer that the mucous coat was sound in its office, and the muscular alone irritable. Her epilepsies occurred three or four times or oftener in the day, sometimes not so often.

The night before she died, she became conscious of the presence of a candle in the room by its light, but she could not distinguish objects. Her intellects never failed; they remained good to the last, excepting that sort of indifference and dulness which always attends a long sickness and solitude.

Her bladder at various times during my attendance continued irritable, but for a few weeks before she died she ceased to complain of it. About the middle of September it was ascertained that the interruption to her menses proceeded from pregnancy.

By a very gradual process she approached her last moment, becoming weaker and weaker, until life was finally extinguished in the epileptic paroxysm of the evening of the 19th.

*Autopsy* on the evening of the 20th, twenty hours after death—present, Drs. PARRISH and PANCOAST.

Exterior aspect, no putrefaction, countenance placid; middle marasmus; no settling of blood in face.

Head. Scalp bled freely on being cut across from ear to ear. Bones of middling thickness.

Membranes. Dura mater of healthy colour and texture, but drier than usual along the middle line of the head; for half an inch or an inch from longitudinal sinus, on either side an unusual number of granular bodies like the glands of Pacchioni, and supposed to be so, they pitted deeply the bones; in the sinus they were not unusually abundant or large. Arachnoidea and pia mater healthy, but they also seemed half dried, and the vessels of the pia mater were not unusually turgid; indeed they were rather collapsed. These membranes adhered very closely to one another, there being no sub-arachnoid effusion:

they also adhered to the dura mater along the longitudinal sinus more than usual, seeming to stick to it.

The texture of the cerebrum was healthy, except that it seemed rather more collapsed and flaccid than usual. Its ventricles contained together six ounces of a clear transparent serum, and were very much distended by it, the corpus collosum being lifted up considerably from the fornix, and the septum so thin that it was almost torn. The fornix adhered more than usual to the velum interpositum, and the latter was turbid or opaque where it passes into the ventricles. The ventricles communicated freely. No thickening of their arachnoidea was perceptible, nor distention of their vessels.

*Cerebellum.* It was universally very flaccid, so that it could not retain its shape, but flattened itself by its own weight. On the under surface of its crus of the left side, there was a flattened oval tumour which originated from the crus, and had grown to the size of a hen's egg, extending itself forwards upon the side of the pons, and flattening it in. This tumour consisted in a congeries of cells of various sizes, the walls of which were in a semi-cartilaginous state, and some of them containing serum, others a tuberculous-like matter, and others again a red spongy bloody matter. The most familiar comparison of it is with the ovarium in the beginning of its cellular dropsies. This tumour had raised up in its development a part of the lateral substance of the cerebellum and the corresponding pia mater and arachnoidea; its first aspect was more like a cyst than any thing else on the side next to the crus of the cerebellum.

The tumour had disturbed the position of all the nerves, from the fourth to the ninth inclusively, because in its development they had to pass along its under surface, and were both displaced and stretched by the circuit they had to perform. The trigeminus was absolutely torn off except a few filaments, from the attachment of its root at the pons, and was there almost absorbed; and what remained of its filaments were separated and pressed into a flat fasciculus. The medulla oblongata was pushed to the right side by this tumour, and bent.

*Thorax. Pleuræ.* Adhesions between right superior lobe and thorax; in other respects healthy.

*Lungs.* Generally sound and healthy; settling of blood at their posterior parts. Right superior lobe contained half a dozen separated tubercles, the largest six or eight lines in diameter. They were of that dry, crumbling, cheese-like kind, which look like old crude tubercles aborted, and which are not attended with derangement of the contiguous pulmonary structure, but merely push it aside. Heart. Natural size, firm and healthy.



Abdomen. Peritoneum healthy. Stomach, mucous coat empty, and of a sienna colour, excepting about the antrum pylori, where it was more of a pink colour. Small intestines healthy. Large intestines healthy; contained but little flatus, but filled with hard, dry compacted fæces, which extended itself for some inches into ileum.

The uterus was up to the umbilicus, had pushed up the intestines, and was next to the abdominal parietes, triangular, and contained a fœtus of about six months, laying across the abdomen, the head to the left corner, and the buttocks to the right corner. The collection of fæces seemed to have arisen from the uterus pressing on the rectum, as her common position was on the back.

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ART. V. *On the Contagious Nature of Dengue.* By S. H. DICKSON, M. D. Professor of the Institutes and Practice of Medicine in the Medical College of South Carolina.

IN my paper on Dengue, published in the November (1823) number of this Journal, I advanced the opinion that it propagated itself, as well by a contagious influence as by an epidemic distemperature of the air. It seems that the majority of the writers who have noticed it have been disposed to deny its contagiousness. This question perhaps deserves further examination, and must be decided ultimately by a reference to facts.

I cannot help thinking it somewhat singular, that in most of the essays alluded to, the circumstances offered as proving the *epidemic prevalence* of the disease, are regarded as disproving its contagious power. But no one at all conversant with the history of disease, can entertain a doubt of the strong tendency of a great number of maladies confessedly contagious, to become epidemic also; small-pox, measles, hooping-cough, all afford familiar illustrations of this principle. To these we may add the plague and typhus, which, if contagious, do not merely confine themselves to this mode of transmission and extension. I did not by any means deny, but rather dwelt upon the very great rapidity with which this singular affection showed itself in different and distant parts of our city, which indeed seemed to me totally inconsistent with its exclusive communication from one subject to another by immediate contact or near approach.

What was the source of this disease? Whence its origin? How was it introduced among us? Were there any circumstances common